D. the middle of the Tower of *Montlehery.*

E. the top of the Pavillon of *Malvoysin.*

F. a pole placed for this purpose on the ruins of the Tower of *Montjay*, with a lock of hay put upon it, that it might be seen at a greater distance.

G. the middle of the Hummock of *Mareuil*, where it was requisite to have a fire made, to distinguish it at a distance.

H. the middle of the great Oval Pavillon of the Castle of *Dammartin.*

I. the Tower of St. *Sampson* in *Clermont.*

K. the Mill of *Jonquieres* near *Compiegne.*

L. the Tower of *Coyvrel.*

M. a little Tree on the hill of *Boulogne* near *Montdidier.*

N. the Tower of *Sourdon.*

O. a little forked Tree upon the point of the *Griffon* neer *Villeneuve St. George.*

P. the Tower of *Montmartre.*

Q. the Tower near St. *Christopher* at *Senlis.*

Thus we have given you, we hope, some satisfaction as to this point, at least as to the material parts of it. As to all the particular niceties, (which it would be too tedious to describe) the Book it self, which surely some time or other will come abroad, may render that satisfaction compleat.

Mean time, I would by no means, that this should put a stop to the Ingenuity and Industry of our Philosophical Friends here in *England*, or deprive either them of the pleasure of comparing their exactness with that of M. *Picarts*, or the world of the advantage of having so important a Problem resolved by divers Artists in different Countries, by different wayes; that so, the whole comming to be reflected upon, one may be able to conclude from the accuratenese of the Observers, who they are that are come the nearest to truth in their Observations.

*An Extract of the French* Journal des Scavans, *concerning a New Invention of Monsieur* Christian Hugens de Zulichem, *of very exact and portative Watches.*

THE Watches of this Invention being made in small, shall serve for very exact Pocket-watches, and when made greater, shall

ſhall be uſeful every where elſe, and particularly to find the Longitudes both by Sea and Land, foraſmuch as their movement is regulated by a principle of Equality, as that of Pendulum's is Cycloid, and that no kind of carriage ſhall be able to ſtop them.

The ſecret of the Invention conſiſts in a Spiral Spring, faſtned by its innermoſt end to the Axis or Arbre of a poiſed Balance (bigger and heavier then is uſual) which turns upon its pivots; and by its other end to a piece that is faſt to the watch-plate. Which ſpring, when the Ballance-wheel is once ſet a going, alternatly ſhuts and opens its ſpires, and with the ſmal help it hath from the watch-wheels, keeps up the motion of the Ballance-wheel, ſo as that, though it turn more or leſs, the times of its reciprocations are always equal to one another.

In Fig.4.Tab.1.the upper plate of the Watch is A B: The Circular Ballance-wheel, C D, of which the Arbre is E F: The Spring turned ſpirally, G H M, faſtned to the Arbre of the Ballance-wheel in M, and to the piece that is faſt to the Watch-plate, in G; all the ſpires or windings of the Spring being free without touching any thing. N O P Q is the Cock, in which one of the pivots of the Ballance-wheel turns; R S is one of the indented Wheels of the Watch, having a ballancing motion, which the Ballance-Wheel of rencontre gives to it. And this Wheel R S catches in the pinion T, which holds on the Arbre of the Ballance, of which by this means the motion is entertained as much as is neceſſary.

## An Extract of a Letter, lately written to the Publiſher by Dr. *Swammerdam*, of an unuſual Rupture of the Meſentery.

*Cum M adVos iret Cl. Dn. C, & quæreret ex me an aliquid literarum per ipſum ad Te curare vellem, nec ſuppeteret aliud ſcribendi argumentum, præſentem caſum rariorem vobis communicare volui.*

*Figura adjecta repræſentat Convolvulum ſive Affectum Iliacum lethalem, ex ruptura & circumvolutione* Meſenterii *inteſtina conſtringentis, ortum.*

* *A A. Inteſtinum Ileum, chylo, flatu & ingeſtis mirum in modum turgens atq; inflammatum.* * V. Tab.2

B B. *Meſenterium dirruptum, conſtituens vinculum quoddam, inteſtina funeſto fato circumligans.* C C.

*CC. Notatum Vinculum, ex rupto Mesenterio ortum, ac, capreoli ferè in modum, intestina nectens.*

*DD. Vinculum illud seorsim delineatum, unà cum ejus capreolo, duabus circumductionibus constans.*

*EE. Convolvulus intestini, seu Ilei pars, vinculo fortiter coarctata, ac sphacelo proxima; à quo alvus omninò adstricta fuit, adeò ut tenuium intestinorum contenta, vomitu ferè continuo, sursùm propulsa fuerint.*

*F. Ilei pars, violentâ illâ at incomprehensibili trajectione intestini per ligamentum DD contra naturam extensa, atq; intestinum quoddam cæcum mentiens.*

*G. Ilei extremum, ubi in Colon degenerat.*

*H. Colon modicè contractum, & naturaliter se habens.*

*L. Intestinum cæcum.*

*Hanc observationem paucis abhinc diebus, præsentibus DD de Penyn & Dortmont, Nosocomii nostri Medicis, nec non Clar. viro D.* Oort, *habuimus. Vale. Dab. raptim, Amstelodami, 9 Octob.* 1674.

## *A Letter of Mr.* Martin Lister, *containing his Observations of the* Astroites *or* Star-stones; *communicated to the Publisher Jan.* 19. 167¾.

SIR, You are pleased to tell me, that my Notes concerning certain Stones figured like Plants, found in the mountains of *Craven*, were well received *. This encourages me to give you the trouble of what I have observ'd of the *Astroites*; which are stones also pointed like the other, but not found, that I know of, in the same Rocks. And we must cross the plain Country, and seek for them hard under the *Yorkshire* Woolds: For, what store I could procure of them, were brought me from *Bugthorp* and *Leppington*. At the former place, my self have seen them digg out of a certain *blew clay* on the banks of a smal rivulet, betwixt the Town and the foot of the Woolds. There are plenty of them washed into the brook; but the most fair and solid are those we get out of the Clay.

* See N. 100. of these Tracts.

I pretend not, to discover to you their Original, no more than I did of the *Entrochi*; but having used some diligence in causing the places, where they are found, to be a litle more searched than is

is usual, I was by that means furnish't with a good quantity of them; which gave me the opportunity to make the following Observations. What light may be hence had, I leave to more judicious persons, acknowledging my self at present not to be able to demonstrate (if they are not Stones of their own kind,) what they have been before petrification.

It is very litle and inconsiderable, what any Author, that I have yet seen, hath said of them; save a very brief description of them in *Gesner*, and the like in *Wormius*; in the rest, all is transcribed.

The Matter and substance of these Stones, if broken, is flint-like, of a dark shining politure; but much softer, and easily corroded by an acid *Menstruum*. Vinegar, indeed, makes them creep; but a stronger spirit, as of Niter, tosses them. I doubt not, but they will readily calcine, as the *Belemnites*, to a very strong and white Lime.

These Stones (as we now find them) are all *Fragments*; as we have noted of the *Entrochi*: Either one single joint, or 2, 3, or more joints set together, making a pentagonous Cylindrical figure or five-sided column. And I have not yet had any piece much above one inch long, which consisted of 18 joints; but I have seen one piece, somewhat shorter than the former, which had 25 joints. These last thin-jointed pieces are quite of a different make, as to all circumstances, from the other, as will appear.

Every joint consists of 5 Angles, which are *either* drawn out and sharp, and consequently the sides of pieces, made up of such joints, are deep-channeled; (and this is the condition of some of the thick-jointed pieces, as well as of all the thin-jointed ones;) *or* the Angles are blunt and round, and the sides plain or very litle hollowed. There are as big, and as small pieces of this sort, as of any other more sharp-angled; and therefore I account them a 3d. species of *Star-stone*. And of this sort was, I guess, that piece which *Wormius* describes; which therefore, he saith, is more like the blown Flower of *Pentaphyllum*, than a *Star*. Besides, the manner of the engraving of the joints in every one of the 3 respective species is also very different, as will be declared.

Where the joints are thin or deep, they are *so* equally throughout the whole piece; yet are there some, but very few, exceptions to this also, of pieces which consist of joints of unequal thick-

ness,

nefs. Many of the thick-jointed pieces have certain joints a thought broader, or a very litle ftanding out at the Angles, and thereby the joints are diftinguifh't into certain Conjugations of 2, 3, or more joints: And thefe Conjugations are very obfervable in the thin-jointed ftones, and are marked out with a fett of Wyers; of which by and by.

The thickeft piece, which hath yet come to my hands, is not above one inch and a half about, and thofe very rare too: From which fize to that of a fmal pin, I have all the intermediat proporons; and thefe fo exceeding fmal pieces are as exactly fhaped, as the greateft. Moft pieces, if not all, of any confiderable length, are not ftraight, but vifibly bent and inclining. All the pieces of any fort are much of an equal thicknefs, or but litle tapering; yet one of the ends, by reafon of a Top-joint, is vifibly the thickeft.

This Top joint hath 5 blunt Angles, and is not hatched or engraven, or but very faintly, on the outfide. Every joint elfe of a piece (fave the top-joint) is an *Intaglia*, and deeply engraven on both fides alike; and will accordingly ferve for a Seal. The middle of each angle is hollow, and the edges of the angles are thick furrowed: The terminations of thefe hatchings are the indented futures, by which the joints are fet together; the ridges of one joint being alternately let into the furrows of the other next it. The Hatchings of the flat-fided pieces are in circular lines; but of the other two fpecies, they are ftraight lines, or near the matter.

In the very center of the 5 angles is a fmal hole, confpicuous in moft joints. Note alfo, that in the middle of each joint, betwixt angle and angle; in the very future, is another fuch like fmal pinhole very apparent, if the ftones be firft well fcoured.

Befides all the former particulars, there may be obferv'd, in the deep-jointed pieces, juft under the top-joint, above defcribed, the *Veftigia* of certain Wyers rather than branches; and fometimes 2, 3, or more of the joints of the Wyers yet adhering. Thefe Wyers are ever *five* in number, viz. one in the middle or hollow part betwixt angle and angle. Again, in *thin*-jointed pieces there are ever *five* of thefe Wyers, or a *fett* of them inferted into every conjugation of joints; fo that it were fome reprefentation of the thing, to imagine the ftalk of *Afperula* or *Equifetum* Alfo I have feen, but that very rarely, (not in one piece amongft 500,) a fett of Wyers

Wyers in the middle of a *deep*-jointed piece. One thin-jointed piece I have by me, where a Wyer of 20 joints and upwards (and how much longer they may be, I know not,) lyes double within the hollow ſide, and by that accident was preſerved in its natural place. Further, ſome lumps of Quarry I have from the ſame place above-nam'd, where the Wyers as well as the Stones themſelves are ſeen in long pieces. It is no wonder, that theſe Wyers are knocked off, and but very rarely found adhering to the Stones they belong to, being very ſmall and ſlender, of a round figure and ſmooth-jointed, being ſett together *per harmoniam* and not indented ſuture. Nothing that I can think of, is ſo like theſe Wyers, as the *antennæ* of Lobſters. Laſtly, ſome of theſe Wyers are knotted, and others of them fairly ſubdivided or branched.

I have, by the aſſiſtance of Mr. *Lodge*, illuſtrated all theſe particulars with *Figures*: Of which this is the Explication; * * See Tab. 2.

1. The Top-joint of an *Aſtroites*, figur'd on both ſides; on the one it is deep engraven, on the other the hatches are ſcarce viſible. Alſo the ends of the 5 Angles are very blunt.

2. A ſecond or ſharp-angled joint with fair hatchings on both ſides.

3. A piece with very narrow and ſharp angles. Alſo the Top-joint deſigned, as it naturally appears ſmooth and without hatchings.

4. A round-angled joint.

5. A flat-ſided piece; where the hatchings are ſomewhat Circular.

6. A thin-jointed piece: Where note alſo, that the angles are much narrower, and of a protracted Oval figure.

7. The biggeſt piece I have yet ſeen. Note alſo its bending.

8. The ſmalleſt piece I have yet met with.

9. The longeſt piece; where every 4th joint is a thought bigger or more prominent than the reſt; as in the 7th fig. alſo is well deſigned.

10. A large and round-angled or flat-ſided piece; to which belongs that ſingle joint noted fig. 4.

11. A flat or not hollow-ſided piece; of which ſort alſo is the 5th figure: The 10th and 4th not much differing.

12. A thin-jointed piece; where the conjugations are marked

out by the *vestigia* of the several sets of Wyers or branches.

13. A piece where the joints are un-equal in thickness.

14. A piece with some part of the Wyers yet adhering in their natural order at the biggest end of the piece.

15. A thin-jointed piece; where note on the left side a single Wyer accidentally preserved in its natural place, though snapt asunder.

16. A thick-jointed piece with a set of Wyers in the middle of it.

17. A good long piece of a Wyer, and a single joint thereof.

*So far Mr. Lister*: To which we cannot but add Mr. *Rays* Notes upon these very Observations.

I was much taken, (*saith he* to Mr. *Lister*) with your Observations concerning the Star-stones, and inform'd in several particulars. For, although I had often seen, and my self also sometimes gather'd of those bodies; yet I did never curiously note the texture, parts and differences of them. As for their *Original*, if you can allow the *Trochites* and *Entrochi* to have been fragments of Rock-plants, I see not, why you should make any difficulty of admitting these to have been so too; the several *internodia* being alike thin in both, and the Commissures not much different; only the external figure doth not correspond. But it is to be considered, that many of the *Trochites* have a pentagonous hole in the middle of them, which if we admit for the receptacle of the pith, it will be as hard to exemplifie such a figur'd pith, as such a figur'd stalk in Land-plants. Your note concerning the Wyers springing out of the furrows or concave angles of some of the *internodia*, and encircling the stalk like the leaves of *asperula* or *equisetum*, was surprising; and seems to me to argue these bodies to belong to the *genus* of Vegetables; no less than Coral, Coralline, and the several sorts of *Pori*; some of which are also jointed: But no vegetable, either of Land or Sea, that I know of, hath such frequent joints and short or thin *internodia*; and so they are things of their own kind, whose *species* is, for ought we know, lost. If they were Vegetables, I guess they were never soft; but grew upon the rocks like Coral, and the other Stone-plants, just now mention'd; hard as they are.

As for *Equisetum*, we know, that the Leaves of some sorts of it are jointed, as well as the Stalk: Else I know no plant that hath jointed leaves; except some sorts of *Rush grass*; though those bristles of *equisetum* surrounding the stalk, neither these reputed leaves of *Rush-grass*, can properly be call'd Leaves, being round, and having no difference

ference of upper and lower superficies. Now that I have upon this occasion mention'd *equisetum*, give me leave to mind you of what I have already publish'd to the world; That I have found, on the banks of the river *Tanar* in *Piedmont*, plenty of the fragments of the stalks of *equisetum* perfectly petrified, with litle or no increase of bulk, so exactly like the plant, that all the *striæ* did all along clearly appear. The colour of these petrified stalks was white.

*An Accompt of two Books:*

I. *Les dix Livres d' Architecture de* VITRUVE, *corrigez, & traduits nouvellement en François, avec des Notes & des Figures; par* Claude Perrault, *de l' Academie Royale des Sciences, & Medecin de la Faculté de* Paris. *Imprimé à* Paris, 1673. *in fol.*

THE Ingenious and Learned Author of this Version of *Vitruvius*, and of the Notes upon him, considering with himself, that one of the Obstacles to the advancement of Architecture was the want of being able to draw the Precepts of that Art out of its true and genuine source, by reason of the great obscurity of *Vitruvius*, who is the only Writer of the Antients that we have upon this subject; did undertake, by a Translation into the French tongue, and by Notes upon the difficult places, and also by illustrating all with Figures, to render this Author more clear and useful to those, that embrace the profession and practice of that Noble Art.

This Interpreter found, that in effect most of the matters contained in *Vitruvius* being so little understood as they are, had need of an Explication more clear and more exact than the Text we have remaining; forasmuch as the Author did not, in his opinion, so much endeavour to make it clear as succinct, in the confidence he had that the *Figures*, added by him would sufficiently explain the matter, and thereby supply what seems to be wanting in the Discourse.

These *Figures*, saith M. *Perrault*, were lost by the negligence of the first Transcribers, that could not design, and that probably also did not judge them altogether so necessary; because the con-

Transa

Fig.1.

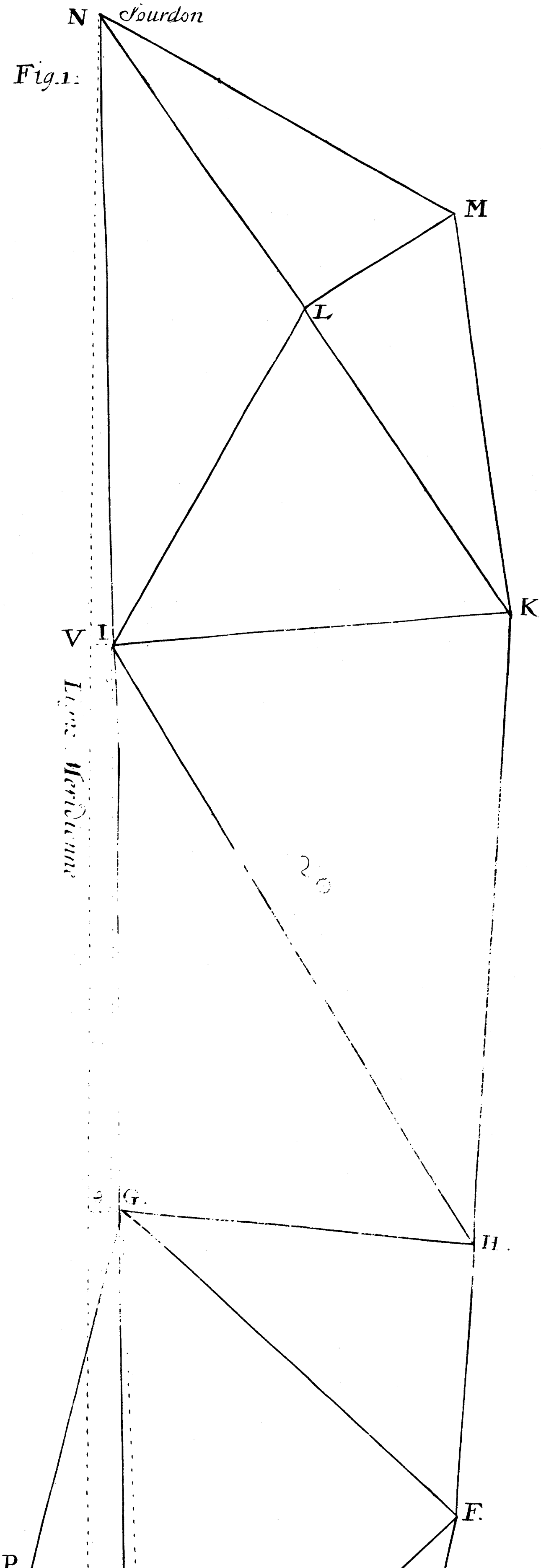



Fig.2.

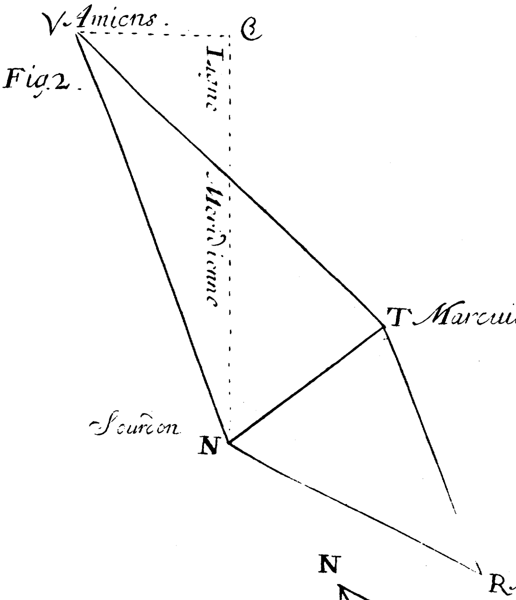
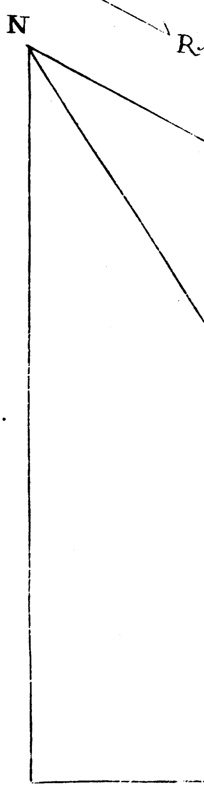
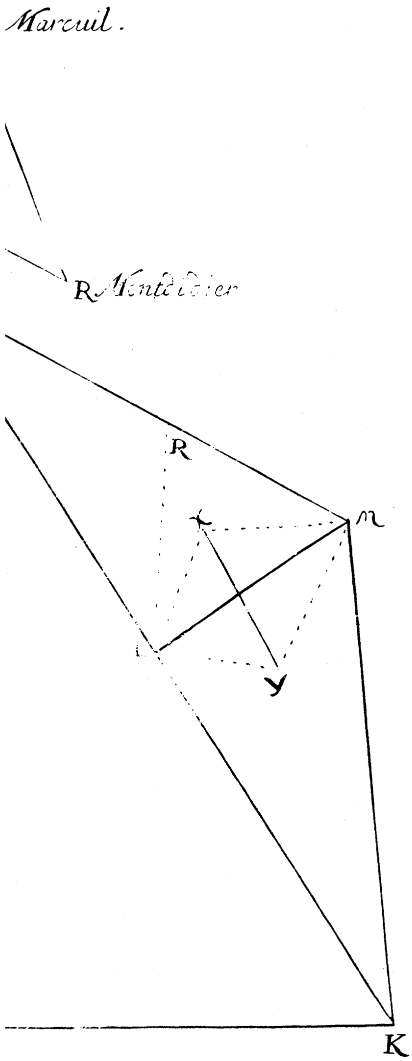



Fig.3.

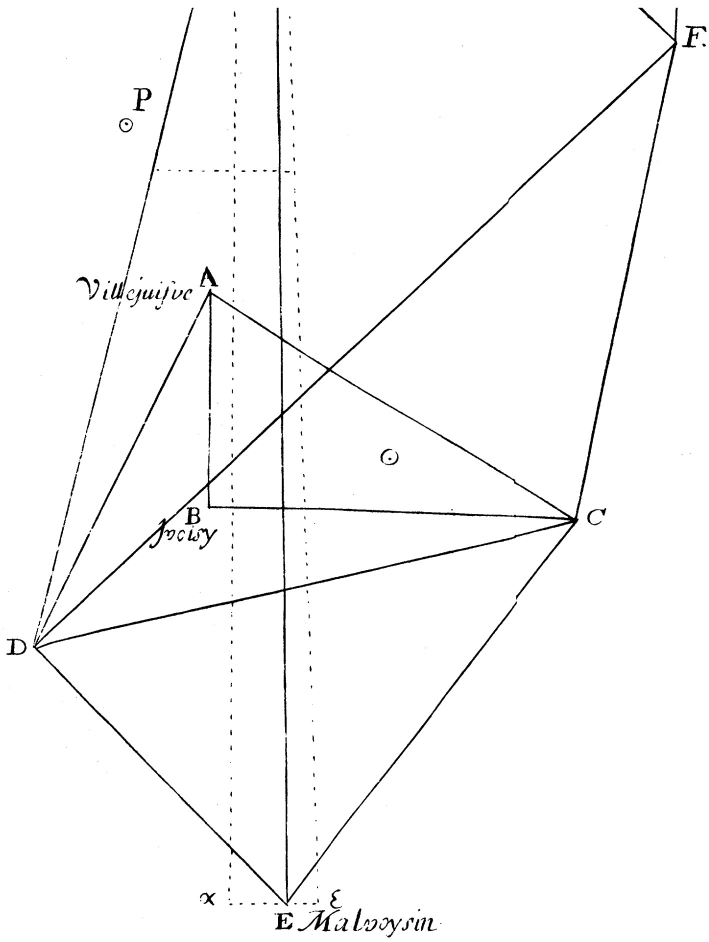



The Watch of M

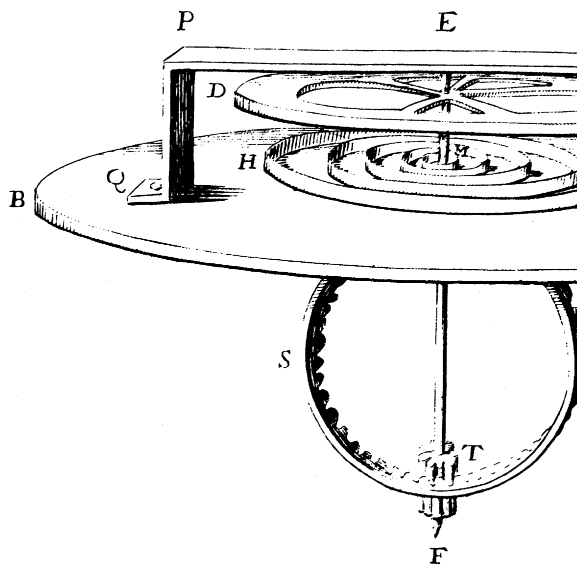
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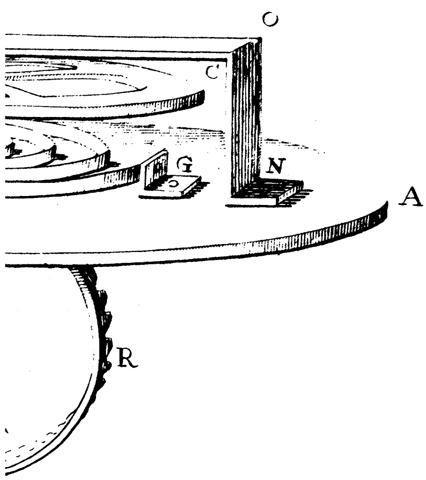

of M. Hugens.

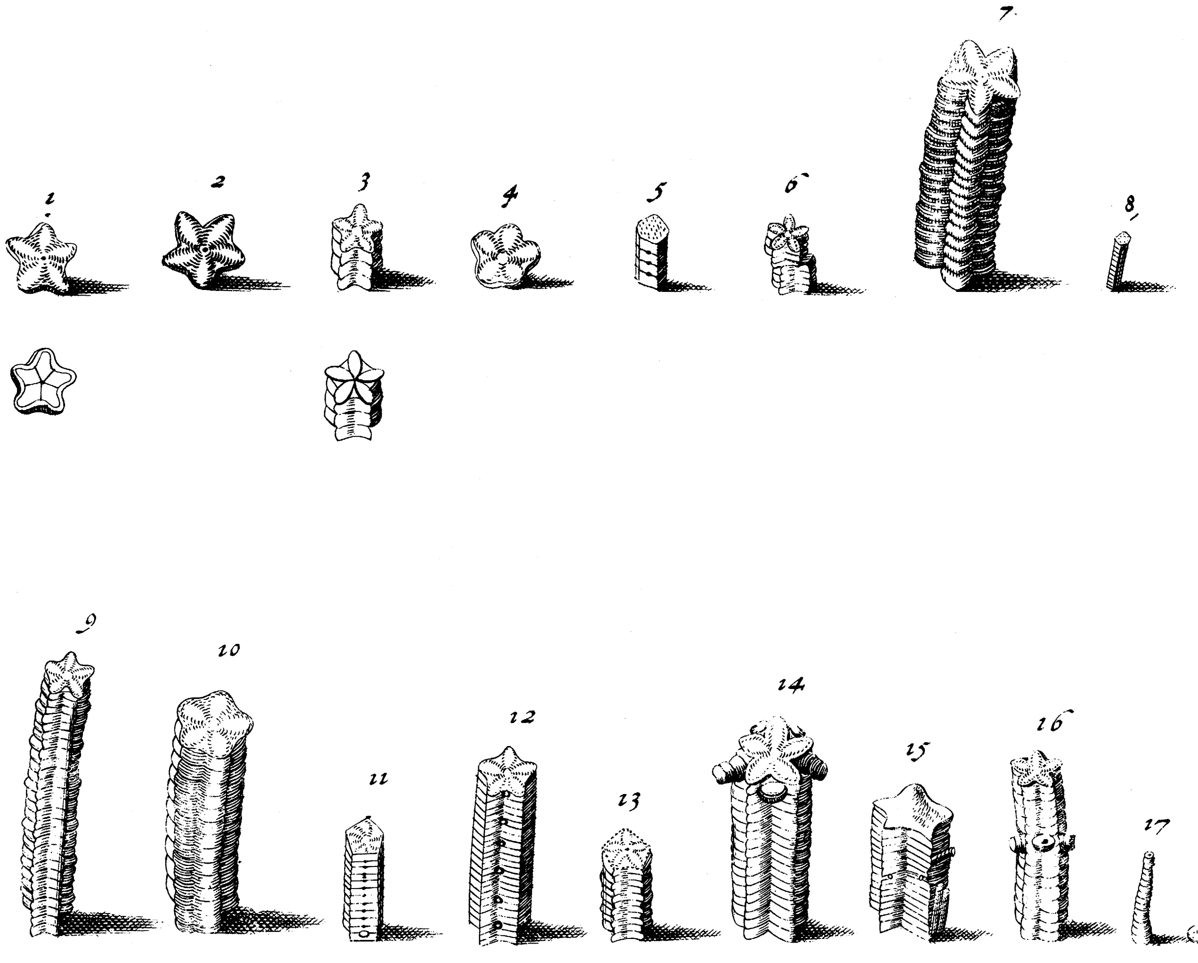



The watch of H



y H.Hugens.




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